



Company/Rig: Noble Energy/ CoreTech
WELL/API#: Wells Ranch USX BB 11-9/05-123-30475
DECLINATION: 8.21 Degrees
TD AS DRILLED: 6797 Feet
COUNTY/STATE: Weld/Colorado
VS-Azi: 0.000 Degrees
Latitude: 40.41177, Longitude: -104.39691
Grid North = True North -0.71 degs (NAD 27)
Grid Convergence Applied = -0.71 degs



DEPTH REFERENCE : RKB=GL/ ELEVATION= 4671 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 7/16/2015 / 08:33

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

SURVEYOR: Sean Bratt

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	****
100.000	0.153	214.228	100.000	-0.111	-0.075	-0.111	0.134	214.228	0.153
200.000	0.587	235.197	199.998	-0.514	-0.571	-0.514	0.768	228.034	0.447
300.000	0.527	204.662	299.993	-1.225	-1.184	-1.225	1.703	224.038	0.299
400.000	0.261	275.734	399.991	-1.620	-1.602	-1.620	2.279	224.686	0.507
500.000	0.169	261.667	499.990	-1.619	-1.975	-1.619	2.553	230.655	0.105
600.000	0.195	211.013	599.990	-1.786	-2.208	-1.786	2.840	231.035	0.157
700.000	0.395	183.817	699.989	-2.275	-2.318	-2.275	3.248	225.543	0.239
800.000	0.382	184.783	799.986	-2.950	-2.369	-2.950	3.784	218.764	0.014
900.000	0.512	244.929	899.984	-3.472	-2.802	-3.472	4.461	218.906	0.462
1000.000	0.140	278.048	999.982	-3.644	-3.328	-3.644	4.935	222.403	0.403
1100.000	0.248	234.951	1099.981	-3.751	-3.626	-3.751	5.217	224.026	0.174
1200.000	0.204	172.543	1199.981	-4.052	-3.779	-4.052	5.541	223.006	0.237
1300.000	0.153	186.340	1299.980	-4.362	-3.771	-4.362	5.766	220.845	0.067
1400.000	0.310	124.593	1399.980	-4.648	-3.563	-4.648	5.857	217.472	0.273
1500.000	0.331	161.150	1499.978	-5.075	-3.247	-5.075	6.025	212.614	0.202
1600.000	0.523	173.783	1599.975	-5.801	-3.105	-5.801	6.580	208.154	0.213
1700.000	0.379	197.547	1699.972	-6.570	-3.155	-6.570	7.288	205.651	0.233
1800.000	0.160	188.536	1799.971	-7.023	-3.275	-7.023	7.749	205.003	0.222

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.000	0.292	81.660	1899.971	-7.123	-3.044	-7.123	7.746	203.136	0.371
2000.000	0.996	77.591	1999.964	-6.900	-1.942	-6.900	7.168	195.723	0.705
2100.000	1.017	91.195	2099.948	-6.731	-0.206	-6.731	6.734	181.750	0.239
2200.000	1.204	59.403	2199.931	-6.215	1.586	-6.215	6.414	165.681	0.634
2300.000	1.435	88.623	2299.905	-5.650	3.742	-5.650	6.777	146.481	0.702
2400.000	1.575	71.175	2399.871	-5.177	6.295	-5.177	8.150	129.431	0.477
2500.000	0.969	83.790	2499.846	-4.642	8.436	-4.642	9.629	118.820	0.665
2600.000	0.624	69.631	2599.836	-4.361	9.787	-4.361	10.715	114.015	0.394
2700.000	0.541	47.941	2699.831	-3.855	10.648	-3.855	11.325	109.899	0.234
2800.000	0.677	24.266	2799.826	-2.999	11.242	-2.999	11.635	104.938	0.283
2900.000	0.890	56.595	2899.817	-2.033	12.133	-2.033	12.302	99.511	0.482
3000.000	1.132	57.514	2999.801	-1.075	13.615	-1.075	13.657	94.514	0.243
3100.000	1.112	39.779	3099.782	0.201	15.069	0.201	15.070	89.235	0.346
3200.000	1.318	76.611	3199.761	1.213	16.808	1.213	16.852	85.872	0.792
3300.000	1.459	108.181	3299.733	1.082	19.137	1.082	19.167	86.763	0.767
3400.000	1.848	133.945	3399.693	-0.434	21.507	-0.434	21.511	91.156	0.829
3500.000	2.262	143.382	3499.629	-3.137	23.845	-3.137	24.050	97.494	0.533
3600.000	2.205	138.155	3599.553	-6.154	26.305	-6.154	27.016	103.166	0.211
3700.000	2.167	143.863	3699.480	-9.114	28.704	-9.114	30.116	107.615	0.221
3800.000	2.075	123.695	3799.413	-11.645	31.325	-11.645	33.419	110.392	0.748
3900.000	1.935	148.126	3899.354	-14.083	33.722	-14.083	36.545	112.666	0.859
4000.000	1.953	166.007	3999.297	-17.170	35.026	-17.170	39.008	116.114	0.604
4100.000	1.886	159.341	4099.241	-20.362	36.018	-20.362	41.376	119.481	0.233
4200.000	2.347	162.813	4199.173	-23.858	37.204	-23.858	44.196	122.671	0.478
4300.000	2.240	185.779	4299.095	-27.758	37.612	-27.758	46.746	126.428	0.919
4400.000	3.185	190.970	4398.982	-32.429	36.886	-32.429	49.115	131.321	0.975
4500.000	3.226	201.414	4498.826	-37.776	35.331	-37.776	51.723	136.916	0.585
4600.000	2.134	216.286	4598.716	-41.897	33.201	-41.897	53.457	141.605	1.286
4700.000	1.186	217.073	4698.673	-44.223	31.475	-44.223	54.281	144.559	0.949
4800.000	1.053	264.200	4798.656	-45.142	29.938	-45.142	54.167	146.448	0.903
4900.000	0.999	270.721	4898.640	-45.223	28.152	-45.223	53.270	148.098	0.128
5000.000	0.866	300.330	4998.627	-44.831	26.627	-44.831	52.142	149.292	0.494
5100.000	0.551	282.139	5098.620	-44.348	25.505	-44.348	51.159	150.097	0.383
5200.000	0.090	143.799	5198.618	-44.310	25.081	-44.310	50.916	150.489	0.622
5300.000	0.110	131.558	5298.618	-44.438	25.199	-44.438	51.085	150.444	0.029
5400.000	0.335	45.411	5398.618	-44.296	25.480	-44.296	51.101	150.092	0.346
5500.000	0.348	16.920	5498.616	-43.800	25.776	-43.800	50.822	149.523	0.169
5600.000	0.390	14.058	5598.614	-43.179	25.947	-43.179	50.376	148.997	0.046
5700.000	0.601	36.047	5698.610	-42.426	26.339	-42.426	49.936	148.167	0.280
5800.000	0.575	55.513	5798.605	-41.718	27.061	-41.718	49.726	147.030	0.200

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
5900.000	0.489	68.151	5898.601	-41.274	27.871	-41.274	49.803	145.971	0.145
6000.000	0.296	94.105	5998.598	-41.134	28.524	-41.134	50.056	145.260	0.258
6100.000	0.550	93.878	6098.596	-41.185	29.261	-41.185	50.521	144.607	0.255
6200.000	0.557	52.720	6198.591	-40.923	30.127	-40.923	50.816	143.640	0.389
6300.000	0.652	87.927	6298.586	-40.608	31.082	-40.608	51.138	142.569	0.377
6400.000	0.276	123.548	6398.583	-40.720	31.851	-40.720	51.698	141.968	0.457
6500.000	0.670	117.454	6498.579	-41.123	32.570	-41.123	52.458	141.620	0.397